57

Final Report--Objective E, Task 6

December 1986

199a

AN EXPERIMENT TO TEST APPARENT REMOTE ACTION (RA) EFFECTS ON ELECTRODERMAL ACTIVITY

By: G. SCOTT HUBBARD
SRI International

WILLIAM W. BRAUD
Mind Science Foundation

Prepared for:

PETER J. McNELIS, DSW
CONTRACTING OFFICER'S TECHNICAL REPRESENTATIVE

333 Ravenswood Avenue
Menlo Park, California 94025 U.S.A.
(415) 326-6200
Cable: SRI INTL MPK
TWX: 910-373-2046

SRI International

Final Report--Objective E, Task 6
Covering the Period 1 October 1985 to 30 September 1986

December 1986

AN EXPERIMENT TO TEST APPARENT REMOTE ACTION (RA) EFFECTS ON ELECTRODERMAL ACTIVITY

By: G. SCOTT HUBBARD
SRI International

WILLIAM W. BRAUD
Mind Science Foundation

Prepared for:

PETER J. McNELIS, DSW
CONTRACTING OFFICER'S TECHNICAL REPRESENTATIVE

SRI Project 1291

Approved by:

ROBERT S. LEONARD, *Executive Director*
Geoscience and Engineering Center

333 Ravenswood Avenue • Menlo Park, California 94025 • U.S.A.
(415) 326-6200 • Cable: SRI [illegible] • TWX: 910-373-2046

Approved For Release 2000/08/10 : CIA-RDP96-00789R003800460001-0

I INTRODUCTION

A new study was conducted* to ascertain whether an apparent remote action (RA) influence on the electrodermal activity (EDA) of an individual could be explained by intuitive data sorting (IDS). In order to enhance the likelihood of obtaining a statistically significant result, SRI International elected to award a subcontract to the Mind Science Foundation (MSF) for an experiment that would be an extension of previously published work.† Electrodermal activity is identical to galvanic skin response (GSR) which is the phasic (ac) fluctuation in skin conductance, as distinguished from the tonic (dc) skin resistance (i.e., basal skin resistance or BSR). The claim put forward by the Mind Science Foundation is that RA by one individual (the "influencer") can directly affect the EDA of another (the subject). We believe that their data may be completely explained by a model developed at SRI International which does not require the existence of RA. Our model (Intuitive Data Sorting--IDS) postulates that some individuals possess an ability to anticipate periods when the EDA of a participant is "quiet," and they are able to act upon this information. In other words, in the absence of all overt information about the EDA, individuals are able to "sort" EDA records into two bins--one with large values (activity periods), one with small values (calming periods)--by initiating the collection of data at the opportune moment. The IDS model is capable of differentiating between causal and informational effects.

In order to develop an appropriate protocol for these experiments, it was decided in advance to first conduct a pilot experimental series and then a formal (or confirmation) experiment. The details of these experiments may be found in Appendices A and B, respectfully. The balance of this report is a critical analysis of those experiments.

---

*This report constitutes Objective E, Task 6, detailing an experiment to determine possible RA effects on living systems.

† Braud, W., and Schlitz, M., "Psychokinetic Influence on Electrodermal Activity, *The Journal of Parapsychology,* Vol. No. 47, No. 2, pp. 95-119 (June 1983).

simply observing the subject's electrodermal chart tracing, and making sensorily and logically informed guesses about the optimal times to press the button and initiate sampling (on the basis of knowledge of the likely time course of the subject's autonomic activity).

In the absence of experimental artifact and any overt knowledge of the participant's electrodermal activity, the MSF wished to determine whether it was possible for the influencer to select a starting time for an RA experiment such as to give a significant correlation between the effort periods and the electrodermal measurements. If IDS is the operative mechanism, it was expected that the MULTIPLE-SEEDS condition would enhance the effect. The dependent variable in this experiment is the EDA. To claim evidence for a statistical anomaly, they required that the psychoenergetic effect (expressed as a percentage) be significantly different from the mean chance expectation (MCE). This measure is obtained by dividing the participant's EDA during the calm-aim effort period by the sum of the EDAs during the activate-aim and calm-aim periods over the course of the trial. In the absence of psi effect, the MCE is 50 percent.

Three statistical analyses were planned:

1. The first analysis would be a comparison of the psi scores (calm-aim percentage scores) for the two conditions [MULTIPLE-SEEDS (IDS) and SINGLE-SEED (RA)]. This analysis would involve a matched (dependent) t test performed on the 32 pairs of scores. Because no directional prediction was made in this case, a two-tailed test was planned, with alpha set at 0.05.

2. The second analysis would be a determination of whether a psi effect occurred in the SINGLE-SEED condition. For this analysis, a single-mean t test would be used to compare the 32 psi scores with an MCE of 50 percent. Because a directional (i.e., psi-hitting) prediction was made in this case, a one-tailed test was planned, with alpha set at 0.05.

3. The third analysis would be a determination of whether a psi effect occurred in the MULTIPLE-SEED condition. For this analysis, a single-mean t test would be used to compare the 32 psi scores with an MCE of 50 percent. Because a directional prediction was also made in this case, a one-tailed test was planned, with alpha set at 0.05.

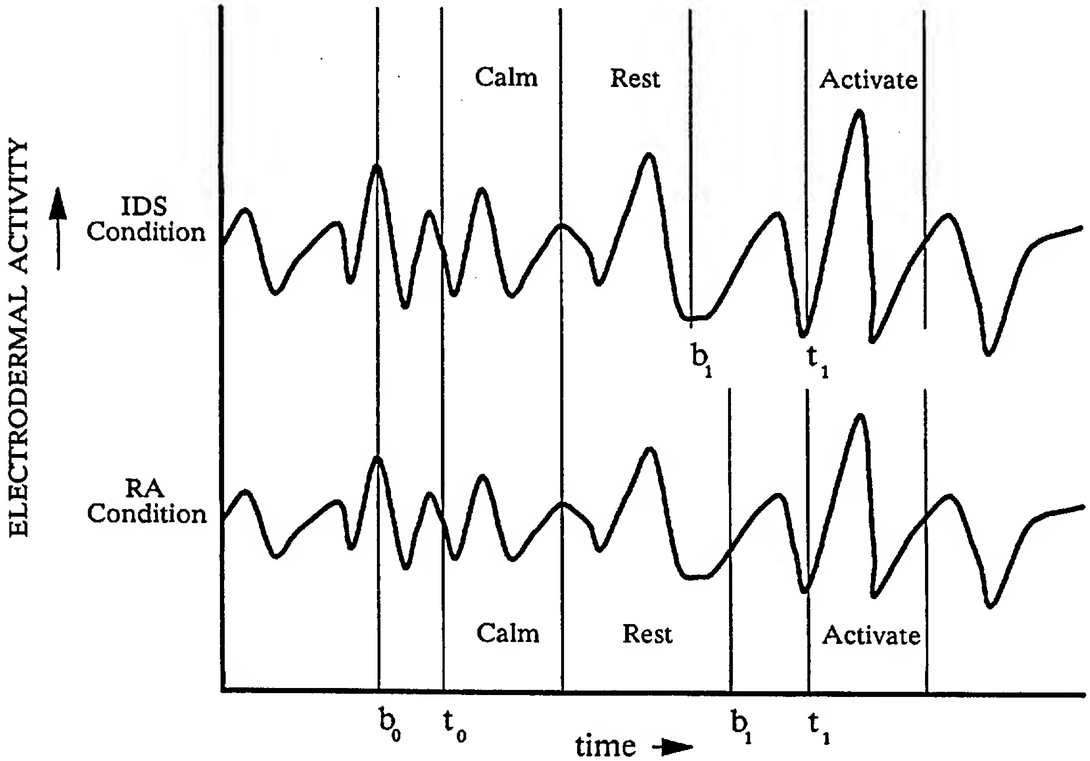

Figure 1 Timing Diagram of Events in MULTIPLE-SEEDS (IDS) and SINGLE-SEED (RA) Conditions for a Given EDA Record. Note that by varying the rest period, the same EDA data is recorded in both activate-aim periods.

In Figure 1, "b" represents a button press by the influencer, which initiates a trial, and "t" is the subsequent tone heard by the influencer alerting him to begin an effort period. As described earlier, the RA condition was distinguished from the IDS condition by fixing all future delay times (e.g., $t_1 - b_1$) at the initial button press, b_0. In the IDS condition, the delay times were determined at the time of each button press. Notice, however, that by interposing a variable rest period, the two experimental conditions can now become *indistinguishable*. As is shown in Figure 1, by appropriately adjusting his rest period in the RA condition, the influencer could completely negate the effect of the previously determined delay time and achieve the same results as in the IDS condition. In other words, the same EDA data would be recorded for an effort period in either condition. Only if there were no

IV CONCLUSIONS AND RECOMMENDATIONS

As is clear from the preceding discussion, the study proposed and performed by the MSF did not provide a valid test of the IDS hypothesis in a putative bio-RA experiment. To be fair in our criticism, it must be acknowledged that it is quite difficult to completely eliminate all possible IDS opportunities in any experiment where the effect of interest is a small statistical perturbation in a time varying output. This difficulty becomes particularly apparent when the experimenter is required to simultaneously satisfy the competing demands of a double-blind protocol and the human need for rest periods.

There appear to be two paths that can serve to more clearly separate IDS from RA. One method is to require that the effect under investigation be sufficiently "large" so as to demonstrate a clearly functional relationship between variables. Such an effect size should approach an infinite signal-to-noise ratio. In disciplines that depend on signal averaging, manipulation of noisy data, or large numbers of measurements to extract meaningful information, a practical definition of an infinite signal-to-noise ratio is 7 to 8 σ. Examples may be found in radar technology, interplanetary satellite communications, and high-energy physics. Unfortunately, the effect sizes in typical statistical RA experiments are essentially always 2 σ.

For those statistical RA experiments whose effect sizes are 2 σ, but where the data sample size (e.g. sequence length in random number generators) can be varied over several orders of magnitude, another approach is dictated by the IDS model. As was demonstrated in our FY 1984 report on IDS, a causal "force" will result in a very different relationship of effect size to sequence length when compared with a purely informational process. During FY 1987, the MSF will be conducting a new group of experiments using the hemolysis rate of red blood cells as the target variable. The intent would be to examine whether a proposed RA influence can slow the rate of hemolysis. Because the number of cells under examination can be varied by dilution over several orders of magnitude, the IDS model could be tested in the following way. We suggest that a separate group of samples be treated with a saline solution that would imitate the proposed RA effect. The balance of the experiment would be conducted in the usual way with control and experimental samples of varying cell number.

Approved For Release 2000/08/10 : CIA-RDP96-00789R003800460001-0

Appendix A

POSSIBLE ROLE OF INTUITIVE DATA SORTING IN BIOLOGICAL PSYCHOKINESIS:

A PILOT STUDY

William Braud and Marilyn Schlitz

Mind Science Foundation

value. This method, when applied to the present data, yields an overall $z = 3.98$, which has an associated $p = 0.000034$. Thus, the observed psi effect is a reliable and robust one.

We have been interpreting the obtained psi effect as a psychokinetic (causal) influence of the subject's autonomic nervous system activity by the distant, isolated influencer. An alternative possibility, however, is that the effect may be contributed totally or partially by an "intuitive data sorting (IDS)" process. The influencer or experimenter psychically, yet unconsciously, scans the future electrodermal activity stream of the subject and begins an experimental session at a time that maximizes the degree of fit between the ongoing electrodermal activity and the prescribed schedule of influence and control epochs. Stated somewhat differently, the experimenter might psychically and unconsciously sort the subject's electrodermal data into two "bins" so that significantly more of the activity in the prescribed direction falls in the influence bins than in the control bins (see May et al., 1985).[2] According to this "informational" model, psi functioning is still in evidence, but is of an informational rather than a causal (psychokinetic) sort.

The present pilot study is designed to test a hypothesis that is suggested by the IDS model. According to this hypothesis, the effectiveness of intuitive data sorting is proportional to the number of opportunities provided for such sorting. It is hypothesized that a single opportunity to psychically sort a future data stream may not be as effective as multiple opportunities for such sorting. Thus, the scoring rate might be greater if the person who initiates the sampling epochs in a bio-PK session is given the freedom to initiate each epoch at whim (and have, for example, 20 opportunities for intuitive data sorting) than it would be if the person were allowed only a single data sorting opportunity. On the other hand, according to a causal psychokinetic interpretation of the bio-PK effect, the scheduling of the sampling epochs should not influence the results; (i.e., the PK effect should be the same whether or not the influencer or experimenter has many or few degrees of freedom in deciding when to initiate sampling epochs.

METHOD

Subjects

Twenty-five individuals participated in this pilot study. Five persons served as influencers and twenty persons served as subjects; each influencer worked with four subjects. The first author (W. Braud) served as experimenter for half of the sessions, while the second

accomplished by watching randomly changing patterns of colored squares of light on a 12-inch display screen 2 meters away, and by listening to prerecorded computer-generated random tones through headphones. The subject was asked to allow his or her mind to be as "random" as possible, observing thoughts, images, and feelings as they spontaneously arose without clinging to any of them. The subject was asked to make herself or himself open to and accepting of a distant mental influence by the influencer, but not to try to consciously guess when influence attempts might be made. The subject, of course, was unaware of the number, timing, or scheduling of the various influence attempts.

The experimenter returned to the influencer's room and consulted a sealed envelope to learn the influence epoch sequence for the session. A set of these sequence envelopes had been prepared before hand by an assistant who was not otherwise involved in the experiment. The envelopes has been prepared by using a table of random numbers and a method that minimized the preparer's degree of freedom in making arbitrary decisions about where to enter the table, and how to assign conditions to the random numbers [see Stanford (1981)[5] for the rationale underlying this method]. The envelope indicated whether the influence epoch sequence was to be calm-activate-calm (CAAC) or its opposite (ACCA). This counterbalanced sequence was used for the 20 sampling epochs of a session. The experimenter entered the proper sequence into the computer program that controlled the experiment, and started playing the audio cassette that presented the subject's random tones.

During the 5-minute adaptation period that followed, the experimenter described to the influencer the new element added to this pilot experiment to test the IDS hypothesis. The influencer was to press a button at what he or she intuitively felt to be the optimal time for beginning the next sampling epoch. The influencer was told that it might be possible to psychically, yet unconsciously, scan the future autonomic activity data stream of the subject and press the button so as to optimally sort the subject's activity into the appropriate sample epochs and thereby increase the scoring rate. The addition of this IDS option is, of course, accompanied by psychological factors such as beliefs and expectations that might obscure its true effectiveness. Therefore, a procedure was designed that would allow us to control for such psychological factors. This procedure required a contrast condition in which the influencer appeared to be initiating sampling epochs by means of his or her button pressing, but in reality was not. This was accomplished in the following manner. In the condition that we expected would optimize IDS, the influencer's button presses initiated sampling epochs after randomly determined variable delays. In this condition (the MULTIPLE SEEDS condition), the precise times of concurrence of the button presses were crucial in determining

influencer and the experimenter (and, of course, the subject) remained unaware of which conditions were in effect in the two respective sessions until the end of the second session, at which time a computer printout revealed the condition sequence. The order of the two conditions was determined randomly by a computer algorithm that was seeded before the first session. This algorithm was based upon the timing of a carriage return, which occurred while the experimenter was entering keyboard information about the subject's name, the date and time of the session, etc. Each of the two sessions required approximately 45 minutes for completion. The two sessions were separated by a brief break of 3 to 5 minutes duration.

At the conclusion of the second session, the computer generated a printout of the subject's average electrodermal activity during each of the 20 sampling epochs of each of the two sessions, along with an indication of the order of the two (SINGLE- or MULTIPLE-SEEDS) conditions. The experimenter returned to the subject's room, removed the headphones and palmar electrodes, then returned with the subject to the experimenter's office where the influencer was now waiting. The influencer and the subject discussed their experiences during the sessions while the experimenter calculated the experimental results, based upon the printout. The three participants discussed the outcome of the experiment and then concluded their visit.

All procedural details that have not been mentioned explicitly may be found in Braud and Schlitz (1983).[3] That paper provides information about specific equipment, electrodermal sampling, etc.

RESULTS OF THE PILOT EXPERIMENT

For each session, percentage scores were calculated for the 10 calm-aim epochs and for the 10 activate-aim epochs. This was done by summing the mean electrodermal activity scores for each of the 20 recording epochs, then dividing this total activity score into the sum of the mean electrodermal activity scores for the 10 calm-aim epochs; the process was repeated for the activate-aim epochs. In the absence of a psi effect, these percentage scores should approximate 50 percent. A psi effect would be evidenced by a set of calm-aim percentage scores that were significantly lower than 50 percent.

Our first analysis was a determination of whether the 20 subjects' SINGLE-SEED calm-aim percentage scores differed significantly from their MULTIPLE-SEEDS calm-aim

the button-press-determined variable delays before each sampling epoch lengthened each of the two formal experimental periods to approximately 40 minutes each. When time was added for (1) initial discussion before the first session, (2) a break between the two sessions, and (3) discussion following the second session, it was not uncommon for the entire length of the experiment to be 2-1/2 hours long. Of the five influencers (each of whom had to make four visits to the laboratory) all but one found the long sessions oppressive.

We had originally planned to select the two influencers having the highest performance records for their sessions as the two "winners" of the pilot trials, and those two persons were to participate as the two influencers for the confirmation study--each influencer working with sixteen subjects. Only one of the five influencers was enthusiastic about this possibility; the other four influencers did not look forward to participating in additional sessions, now that they were aware of how lengthy the sessions were. Thus, during the pilot study, the influencers (with one exception) functioned with mixed feelings. They wished to do well in their sessions and score highly; on the other hand, they were aware that high scoring might earn them the dubious "reward" of participating in a large number of lengthy confirmation sessions. It is not unlikely that these mixed motivations may have led to less than optimal moods in the participants and could have negatively influenced the outcome of the pilot study. Interestingly, the highest scoring influencer was in fact the person who objected least to the session lengths, and who appeared to be undaunted by the possibility of additional confirmation trials.

In light of these considerations, it was necessary for us to revise our plans for the confirmation study. Instead of having only two influencers, each working with sixteen subjects, we decided to ask eight influencers to work with four subjects each. This would greatly lessen the work load of the influencers. We also decided to drastically reduce the length of each session. This would be accomplished by (1) reducing the number of sampling epochs from 20 to 12, (2) eliminating the 5-minute adaptation period at the beginning of each session, (3) reducing the range of the variable delay between button-press and sampling epoch initiation to 30 to 40 seconds, and (4) reducing the duration of the break between a subject's two sessions to one minute. As a result of these changes, the new session lengths for the confirmation trials would be approximately 15 minutes each, and an entire two-session procedure could be accomplished in approximately 40 minutes, rather than the 2 1/2 hours required in the pilot study. It was our hope that these new conditions would render the sessions less trying, and would produce more optimal moods in all experimental participants.

REFERENCES (Appendix A)

1. Rosenthal, R., "Combining Results of Independent Studies," *Psychological Bulletin,* Vol. 85, pp. 185–193 (1978).

2. May, E., Radin, D., Hubbard, G., Humphrey, B, and Utts, J., "Psi Experiments with Random Number Generators: An Informational Model," Proceedings of 28th Annual Parapsychological Association Convention, Tufts University, Medford, Massachusetts (1985).

3. Braud, W., and Schlitz, M., "Psychokinetic Influence on Electrodermal Activity," *Journal of Parapsychology,* Vol. 47, pp. 95–119 (1983).

4. Schlitz, M., and Braud, W., Reiki–Plus Natural Healing: An Ethnographic/Experimental Study," *Psi Research,* Vol. 4, pp. 100–123 (1985).

5. Stanford, R., "Are We Shamans or Scientists?" *Journal of the American Society for Psychical Research,* Vol. 75, pp. 61–70 (1981).

Approved For Release 2000/08/10 : CIA-RDP96-00789R003800460001-0

INTRODUCTION

For a number of years, researchers at the Mind Science Foundation have been engaged in studies of the distant mental influence of biological systems (i.e., "biological psychokinesis" or "bio-PK"). While the biological target systems for some of these studies have included the spatial orientation of fish, the locomotor activity of small animals, and the rate of hemolysis of human red blood cells, the system with which we have worked most often has been the electrodermal activity of another person. The experimental protocol of a typical electrodermal bio-PK experiment is as follows. The subject sits in a comfortable room watching a random colored-lights display and listening to random tones through headphones while his or her electrodermal activity is monitored via palmar electrodes. Concurrently, an "influencer" in another room (isolated from all possible conventional sensorimotor interactions with the subject) attempts to mentally influence the ongoing electrodermal activity of the subject according to a predetermined schedule known to the subject. The subject's spontaneous electrodermal activity (skin resistance responses) is objectively assessed during each of ten 30-second influence periods and each of ten 30-second noninfluence control periods by means of an analog-to-digital converter interfaced with a microcomputer. By chance, the average electrodermal activity during influence epochs should equal that during control epochs. A statistically significant excess of electrodermal activity in the prescribed direction (i.e., higher influence than control scores under an "activate aim" condition or lower influence than control scores under a "calm aim" condition) provides evidence for a psi effect in the experiment.

The protocol just described has been used in a series of eleven electrodermal bio-PK experiments in which a total of 174 subjects have participated. An appropriate method for assessing the statistical significance of the entire series is the z-score addition method described by Rosenthal (1978, 1979).[1 2*] Here, one converts the studies' obtained p values into z-scores, sums these z-scores, and divides by the square root of the number of studies being combined; the result is itself a z-score that can be evaluated by means of an associate p

*References are listed at the end of Appendix B.

minute. As a result of these changes, the new session lengths for the confirmation trials were approximately 15 minutes each, and the entire two-session procedure could be accomplished in approximately 40 minutes, rather than the 2 1/2 hours required in the pilot study. It was our hope that these new conditions would render the sessions less trying and would produce more optimal moods in all experiment participants.

METHOD

Subjects

Forty individuals participated in this confirmation study. Eight persons served as influencers and thirty-two persons served as subjects; each influencer worked with four subjects. The first author served as experimenter for half of the sessions, while the second author served as experimenter for the remaining half of the sessions. One of the eight influencers was the person who had had the highest performance record in the pilot study; this was also the person who had been least bothered by the lengths of the pilot sessions and who had been the most enthusiastic about participating in further experiments. The second influencer had participated successfully in prior electrodermal bio-PK experiments. The third influencer was a psi researcher who had a history of successful psychokinesis performances in his own experiments. The fourth and fifth influencers had participated successfully in several previous psi experiments at the Foundation. The sixth and seventh influencers were very interested in psychic healing and had had ostensible psi healing interaction in their everyday lives. The eighth influencer had participated in previous psi experiments at the Foundation as a subject and as a student experimenter, and had expressed an interest in the bio-PK confirmation experiment. Four influencers were males and four were females.

The thirty-two subjects were selected from a pool of persons expressing interest in participating in bio-PK and other psi experiments. Some participants had previously enrolled in workshops presented by the two authors. Others were undergraduate students from a local college who participated as part of a course requirement. Eight (one-fourth) of the subjects had participated in prior psi experiments conducted at the Foundation; twenty-four (three-fourths) of the subjects were first-time participants. Twenty-two of the subjects were females, and ten were males.

The envelopes had been prepared through the use of a table of random numbers using a method that minimized the preparer's degree of freedom in making arbitrary decisions about where to enter the table, and how to assign conditions to the random numbers [see Stanford (1981) for the rationale underlying this method]. The envelope indicated whether the influence epoch sequence was to be calm-activate-activate-calm (CAAC) or its opposite (ACCA). This counterbalanced sequence was used for the 12 sampling epochs of a session. The experimenter entered the proper sequence into the computer, recorded the subject's basal skin resistance, then started the computer program that controlled the experiment and started playing the audio cassette that presented the subject's random tones.

The new element that had been added to this experiment to test the IDS hypothesis was described to the influencer by the experimenter. The influencer was to press a button at what he or she intuitively felt to be the optimal time for beginning the next sampling epoch. The influencer was told that it might be possible to psychically, yet unconsciously, scan the future autonomic activity data stream of the subject, and press the button so as to optimally sort the subject's activity into the appropriate sampling epochs--thereby increasing the scoring rate. The addition of this IDS option is, of course, accompanied by psychological factors such as beliefs and expectations that might obscure its true effectiveness. Therefore, a procedure was designed that would allow us to control for such psychological factors. This procedure required a contrast condition in which the influencer appeared to be initiating sampling epochs by means of his or her button pressing, but in reality was not. This was accomplished in the following manner. In the condition that we expected would optimize IDS, the influencer's button presses initiated sampling epochs after randomly determined variable delays. In this condition (the MULTIPLE-SEEDS condition), the precise times of occurrence of the button presses were crucial in determining the delay periods, since the button presses selected the clock values that served as the different seeds for the pseudorandom algorithm that generated the values of the delays. Thus, button presses actually could be efficacious in determining sampling scheduling. In the contrast condition (the SINGLE-SEED condition), all random delay periods were determined by the first of the influencer's 12 button presses. The computer's clock value at the time of this first button press seeded the pseudorandom algorithm once and only once, and all other button presses "fetched" their random delays from the already determined outcome of that first seeding.

The use of randomly varying delays between button presses and sampling epoch initiations accomplished two things: (1) they allowed the influencer and the experimenter to remain blind as to whether a SINGLE-SEED or MULTIPLE-SEEDS condition was in effect

At the conclusion of the second session, the computer generated a printout of the subject's average electrodermal activity during each of the 12 sampling epochs of each of the two sessions, along with an indication of the order of the two (SINGLE- or MULTIPLE-SEEDS) conditions. The experimenter returned to the subject's room, removed the headphones and palmar electrodes, then returned with the subject to the experimenter's office where the influencer was now waiting. The influencer and the subject discussed their experiences during the sessions while the experimenter calculated the experimental results, based upon the printout. The three participants discussed the outcome of the experiment and then concluded their visit.

All procedural details that have not been mentioned explicitly may be found in Braud and Schlitz (1983).[3] That paper provides information about specific equipment, electrodermal sampling, etc.

Three statistical analyses were planned:

1. A comparison of the psi scores (calm-aim percentage scores) for the two SEEDS conditions. This analysis would involve a matched (dependent) t test performed on the 32 pairs of scores. Since no directional prediction was made in this case, a two-tailed test was planned, with alpha set at 0.05.

2. A determination of whether a psi effect occurred in the SINGLE SEED condition. For this analysis, a single-mean t test would be used to compare the 32 psi scores with a mean chance expectation (MCE) of 50 percent. Since a directional (i.e, psi-hitting) prediction was made in this case, a one-tailed test was planned, with alpha set at 0.05.

3. A determination of whether a psi effect occurred in the MULTIPLE-SEED condition. For this analysis, a single-mean t test would be used to compare the 32 psi scores with a mean chance expectation (MCE) of 50 percent. Since a directional (i.e., psi-hitting) prediction was made in this case, a one-tailed test was planned, with alpha set at 0.05.

RESULTS OF THE CONFIRMATION EXPERIMENT

For each session, a total score was calculated for all 12 recording epochs (6 calm-aim and 6 activate-aim). This total score was divided into the sum of the mean electrodermal

DISCUSSION

In the pilot study that preceded this experiment, no evidence of a psi effect was found in the data. We hypothesized that the absence of psi may have been contributed by negative moods in all participants (subjects, influencers, and experimenters) due to the extreme length of the experimental sessions (often 2 1/2 hours long). Therefore, we drastically shortened the session lengths, hoping to eliminate this negative factor. Our modifications (described in the Introduction) appear to have been successful, since evidence for psi did emerge in the present experiment.

The major hypothesis that was being tested in this study (derived from an IDS conceptualization of the bio-PK effect) was that greater psi scoring would occur in the condition in which there were multiple opportunities for intuitive data sorting (i.e., the MULTIPLE-SEEDS condition) than in the condition in which there was only one such opportunity (i.e., the SINGLE-SEED Condition). The outcome of the Confirmation experiment was not consistent with this informational interpretation of the bio-PK effect. Significant psi-scoring occurred in the "older" condition, which had been in effect in all of our prior bio-PK research--namely, a SINGLE-SEED condition. Significant psi-scoring failed to emerge in the new condition, which was hypothesized to favor enhanced intuitive data sorting (i.e., the MULTIPLE-SEEDS condition). In fact, the superiority of the SINGLE-SEED condition over the MULTIPLE-SEEDS condition closely approached statistical significance. Had the conditions comparison actually reached significance, that finding of superior SINGLE-SEED condition performance would have been quite difficult to explain in IDS terms. As it is, the absence of MULTIPLE-SEEDS condition superiority is not consistent with an "informational" interpretation but is more congruent with a "causal" or "psychokinetic" interpretation of the bio-PK effect.

The reason for the absence of a significant bio-PK effect in the MULTIPLE-SEEDS condition is not clear. We might speculate that the provision of a second, potentially effective, psychic task in that condition may have resulted in a form of "distraction," which could have disrupted the influencer's PK performance, mediated perhaps by an increased diffusion or "spreading thin" of the influencer's attention [see Braud (1978)[6] for an elaboration of this "spreading thin" possibility]. If this were indeed the case, it would constitute a remarkable finding, since the potential effectiveness of the multiple button presses in the MULTIPLE-SEEDS but not in the SINGLE-SEED condition is not discernible at a conventional sensorimotor level (due to the double-blind stratagem by which the effectiveness

sampled, averaged, and printed for the 30-second intertrial or rest periods immediately preceding each of the 12 sampling epochs. The influencer typically pressed the button almost immediately after one sampling epoch in order to begin the next interval as quickly as possible; the latter interval consisted of the 0 to 10-second random delay yielded by the seeded algorithm, a 30-second intertrial or rest period, and the 30-second sampling epoch itself. Thus, in the Confirmation experiment, mean electrodermal activity data were available for what closely approximated 24 successive 30-second periods. An autocorrelation coefficient calculated for Lag 2 would provide a good estimate of a possible trend for electrodermal activity at time t to be related to activity shortly after 30 to 40 seconds had elapsed. Such Lag 2 autocorrelation coefficients were calculated for each of the 32 sessions of the SINGLE-SEED condition, and for each of the 32 sessions of the MULTIPLE-SEEDS condition. The autocorrelations were found to be quite small and were not significantly different from zero for either the SINGLE-SEED condition (X = 0.059, $t = 1.51$, 31 df, $p = 0.14$, two-tailed) or the MULTIPLE-SEEDS condition (X = 0.027, $t = 0.78$, 31 df, $p = 0.44$, two-tailed).

As an additional check of the trend artifact possibility, we calculated the overall correlation between the 64 LAG 2 autocorrelation coefficients and the 64 bio-PK scores (i.e., the percent calm-aim scores) of the Confirmation experiment. The correlation was nonsignificant and was extremely close to zero ($r = -0.00278$); it indicated no relationship between psi scoring and electrodermal temporal trend at the appropriate time interval. Thus, both artifact possibilities may be effectively ruled out for this Confirmation experiment.*

Finally, it could be argued that the SINGLE-SEED condition itself provides sufficient opportunity for effective intuitive data sorting, particularly if one ascribes a "goal-oriented" (see Schmidt, 1974)[7] or "diametric" (see Foster, 1940;[8] Nash, 1986[9]) property to the psi process. There is a danger, however, in posting increasingly higher levels in which intuitive data sorting and goal-orientedness may operate, and that danger is that both of those notions

*Autocorrelation coefficients (r_k) were calculated according to the formula:

$$r_k = \frac{\sum_{t=1}^{n-k} (z_t - \bar{z})(z_{t+k} - \bar{z})}{\sum_{t=1}^{n} (z_t - \bar{z})^2}$$

Where k = the lag number; z_t = raw score at time t

n = total number of values being correlated; $\bar{z}$ = mean score

REFERENCES (Appendix B)

1. Rosenthal, R., "Combining Results of Independent Studies," *Psychological Bulletin,* Vol. 85, pp. 185–193 (1978).

2. Rosenthal, R., "The 'File Drawer Problem' and Tolerance for Null Results," *Psychological Bulletin,* Vol. 86, pp. 638–641 (1979).

3. Braud, W., and Schlitz, M., "Psychokinetic Influence on Electrodermal Activity," *Journal of Parapsychology*, Vol. 47, pp. 95–119 (1983).

4. Schlitz, M., and Braud, W., "Reiki–Plus Natural Healing: An Ethnographic/Experimental Study," *Psi Research*, Vol. 4, pp. 100–123 (1985).

5. Stanford, R., "Are We Shamans Or Scientists?" *Journal of the American Society for Psychical Research*, Vol. 75, pp. 61–70 (1981).

6. Braud, W., "Psi Conductive Conditions: Explorations and Interpretations," S. Shapin and L. Coly (Eds.), *Psi and States of Awareness*, Parapsychology Foundation, New York, pp. 29–31 (1978).

7. Schmidt, H., "Psychokinesis," E. Mitchell et al. (J. White, Ed.) *Psychic Exploration: A Challenge for Science*, New York, Putnam, pp. 190–191 (1974).

8. Foster, A., "Is ESP Diametric?" *Journal of Parapsychology,* Vol. 4, pp. 325–328 (1940).

9. Nash, C., "Parapsychology: The Science of Psiology," Thomas, Springfield, Illinois, pp. 202–203 (1986).